

Magnetic properties of Fe/Bi trilayered and multilayered systems

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Artificially multilayered films, in which one of the constituent elements is ferromagnetic in its bulk form, have attracted much interest not only as magnetic materials for application to the device but also as a system of magnetism problem. The Fe/Bi system exhibits complete immiscibility in the condensed state. There have been few magnetic Fe/Bi multilayers reported so far, except sandwich Fe-Bi amorphous films[1] and Fe/Bi multilayers cooled substrate by liquid nitrogen[2]. We report the structural and magnetic properties of the Fe/Bi systems. Multilayered and sandwiched Fe/Bi films were prepared on SrTiO₃(100) by Molecular Beam Epitaxy method under a variety of conditions, such as thickness of Fe and substrate temperature over 373K. The relationship between the structure and magnetic properties were investigated by means of magnetic measurement, X-ray diffraction, and electron diffraction. All films exhibited ferromagnetism. Saturation magnetization and coercive force of the multilayered films depend on Fe layer thickness of t_{Fe} . The magnetization of the sandwiched films shows slight difference from that of pure Fe and exhibits a kink at the field of $\pm 130\text{G}$.

[1] G.Cort et al. : Phys.Rev.B**23**(1981)148

[2] F.Z.Cui et al. : J.Appl.Phys.68(1990)701